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Case Report

Coexistence of Osteoid Osteoma and Mallet Finger: A Case Report

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Abstract

This case study presents the clinical manifestation, diagnostic assessment, and treatment of an 18-year-old right-handed Arab male patient who simultaneously had osteoid osteoma in the distal phalanx of the right middle finger and mallet finger deformity. The patient displayed a swan neck deformity and swelling of the distal phalanx, which progressively worsened over a span of 18 months. Radiographic and magnetic resonance imaging (MRI) findings indicated osteoid osteoma, with potential alternative diagnoses including glomus tumor, osteomyelitis, and enchondromas. The soft tissue mass was surgically removed, confirming the diagnosis. This case emphasizes the significance of considering multiple causes in complex musculoskeletal presentations and the necessity of a multidisciplinary approach to management.

Keywords: Coexistence; Osteoid Osteoma; Mallet Finger

Introduction

Osteoid osteoma is a relatively common noncancerous bone tumor that typically affects the cortex of long bones, with a preference for the lower extremities [1]. It was initially described by Jaffe in 1935 as a distinct condition characterized by a central nidus of osteoid tissue surrounded by reactive bone formation [2]. Although osteoid osteomas can occur at any age, they most frequently impact adolescents and young adults, with a higher incidence in males [3]. Clinically, patients with osteoid osteoma often experience localized pain that intensifies at night and is alleviated by non-steroidal anti-inflammatory drugs (NSAIDs) [4]. This specific pain pattern, known as "night pain," strongly suggests the diagnosis. However, in certain cases, the pain may be dull and persistent, leading to diagnostic complexities and treatment delays [5]. Imaging plays a critical role in diagnosing osteoid osteoma. Radiographic findings typically reveal a small, well-defined radiolucent nidus surrounded by sclerotic bone, which may be obscured by reactive changes in the adjacent bone [6]. Computed tomography (CT) is widely recognized as the most reliable imaging technique for identifying the nidus, offering a high level of accuracy and precision [6]. In addition, magnetic resonance imaging (MRI) can be used to assess any accompanying soft tissue alterations, such as bone marrow edema and periosteal reaction [8]. The preferred treatment for osteoid osteoma is surgical excision of the nidus, which has consistently shown excellent outcomes and low recurrence rates in medical literature [4]. In cases where surgery is not feasible or contraindicated, alternative treatment options like percutaneous radiofrequency ablation and percutaneous ethanol injection have been successfully employed [1]. Prompt diagnosis and appropriate management are crucial in addressing osteoid osteoma's distinct clinical and radiographic features, ensuring symptom relief and preventing complications. However, the presence of osteoid osteoma alongside other musculoskeletal conditions, like mallet finger, presents unique challenges in terms

of diagnosis and management, as illustrated in the following case report.

Case Presentation

A right-handed 18-year-old Arab male presented with a swan neck deformity and swelling in the distal phalanx of his right middle finger that gradually increased over 18 months with intermittent pain, responding well to non-steroidal anti-inflammatory drugs (NSAIDs). On physical examination, hyperextension of the PIP joint and flexion deformity of DIP joint was noted on the right middle finger. It also showed a localized swelling of the distal phalanx and dorsum aspect of the DIP joint along with an enlarged and drum-like appearance of the nail. The finger was tender, with good capillary refill and sensation. The patient attributed the condition to a sports-related injury that resulted in mallet finger-induced swan neck deformity. Radiographic imaging revealed a decrease in joint space at the third DIP joint, along with widespread sclerotic changes in the distal phalanx. MRI confirmed the presence of bone marrow edema and periosteal reaction, consistent with osteoid osteoma. Surgical removal of the soft tissue mass confirmed the diagnosis.

Imaging Reports

Radiography demonstrated a reduction in joint space at the third DIP joint, diffuse sclerotic changes in the distal phalanx, irregularities in the cortical bone at the tip of the distal phalanx, diffuse soft tissue swelling at the distal aspect of the middle finger, and osteophyte-like changes at the base (Figure 1). MRI revealed bone marrow edema and periosteal reaction affecting the distal phalanx and the proximal aspect of the middle phalanx, while sparing the DIP joint (Figure 2).

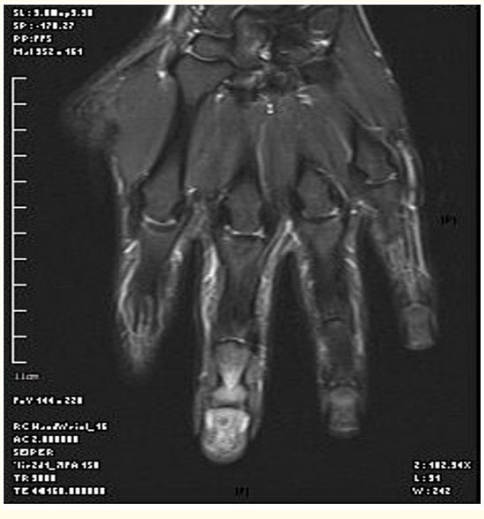

Figure 1

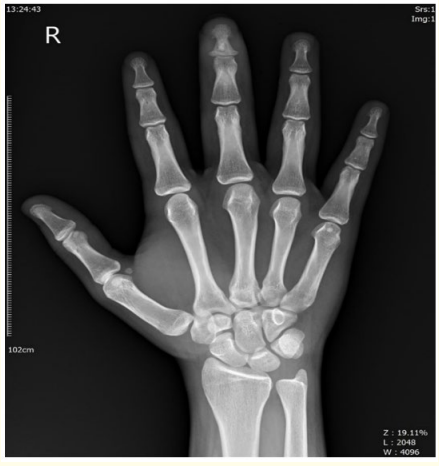

Figure 2

During surgery, an L-shaped incision was done over the right middle finger and soft tissue mass at the dorsum aspect of the DIP joint was excised. The main extensor tendon was completely absent.

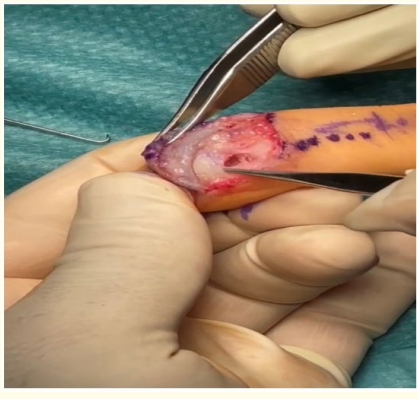

Figure 3: Bone cyst showing good cancellous bone and margins.

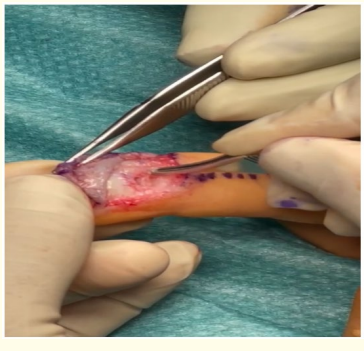

Figure 4: Main extensor tendon held by forceps is detached from the base of the distal phalanx.

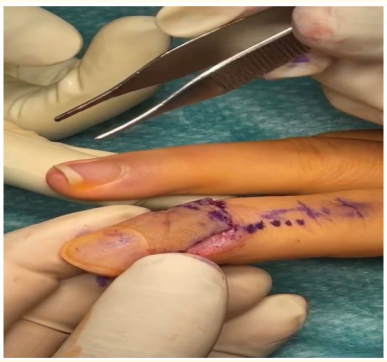

Figure 5: Due to the vascularity of the tumor, the distal phalanx has drum-like appearance or clubbing.

Surgical Pathology report: Histologic examination of the right middle finger mass reveals a fragment of woven bone with prominent osteoblast rimming and scattered osteoclast like giant cells. The osteoblasts have no significant atypia and are surrounding the bone matrix in a single layer. Most importantly, no host bone permeation is appreciated. Overall, the above features are of an osteoid osteoma.

Discussion

Mallet finger, also referred to as baseball finger or drop finger, is a prevalent orthopedic injury characterized by the inability to fully extend the distal interphalangeal joint (DIPJ) of the finger [8]. It was initially described by Segond in 1880 and typically occurs because of forceful flexion or laceration of the dorsal aspect of the finger at the DIPJ [9]. This condition primarily affects the long fingers, particularly those on the side of the hand closer to the little finger, and is more commonly seen in males [10]. The diagnosis of mallet finger is primarily based on clinical evaluation, relying on the characteristic inability to actively extend the DIPJ with the fingertip in a flexed position. Imaging techniques such as X-rays may be used to assess for associated fractures or avulsion injuries, which can help guide treatment decisions [10]. Treatment options for mallet finger include conservative measures such as splinting the DIPJ in extension for a period of 6-8 weeks, allowing the disrupted tendon to heal. Surgical intervention may be considered in cases involving large fracture fragments, open injuries, or failure of conservative management [11]. The choice between conservative and surgical management depends on factors such as the extent of the injury, patient preferences, and functional demands. Mallet finger can lead to complications such as stiffness in the joint, residual deformity, and limited range of motion if not appropriately managed. It is crucial to closely monitor and provide rehabilitation to achieve optimal outcomes and prevent long-term complications [12]. On the contrary, osteoid osteoma is a noncancerous tumor that primarily affects the outer layer of long bones, especially in the lower extremities [13]. It typically presents with localized pain that worsens during the night and responds well to NSAIDs [4]. Radiographic findings show a central nidus surrounded by reactive bone formation, and MRI often reveals bone marrow edema and periosteal reaction [7]. Surgical excision is the preferred treatment for osteoid osteoma, with favorable outcomes and low recurrence rates reported in medical literature [13]. In cases where surgery is not feasible or contraindicated, alternative treatment options like radiofrequency, ablation and percutaneous ethanol injection may be considered [14]. The simultaneous presence of osteoid osteoma and mallet finger in a single finger poses a distinctive challenge in diagnosis due to potential overlap in clinical symptoms. Nevertheless, a thorough clinical assessment and the use of appropriate diagnostic imaging can facilitate an accurate diagnosis and help in determining the most suitable treatment approach. In the specific case discussed, the radiographic and MRI results indicated osteoid osteoma, which was subsequently confirmed through surgical removal.

Conclusion

The co-occurrence of osteoid osteoma and mallet finger in the same finger is an uncommon phenomenon. It is crucial for healthcare providers to maintain a high level of suspicion for multiple underlying causes when dealing with patients who present complex musculoskeletal issues to ensure precise diagnosis and effective management. A collaborative effort involving orthopedic surgery, oncology, and hand therapy may be essential to achieve optimal outcomes in such complex cases.

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